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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,903	08/11/2006	Thomas William Beck	2004P87074WOUS	7739

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SIEMENS CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
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EXAMINER	
SHABMAN, MARK A	

ART UNIT	PAPER NUMBER
2856	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/597,903	BECK ET AL.	
	Examiner	Art Unit	
	MARK SHABMAN	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 May 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claim 12 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 21 May 2008 with respect to claims 2-11 have been fully considered but they are not persuasive.

With regards to independent claim 5, applicant argues that no prima facie case of obviousness could be established between the Selbie and Bartels references. Examiner hereby disagrees with this assessment in that the teachings of filtering of a fluid and integrity testing are taught by the Selbie reference and the teaching of backwashing the filter is introduced by Bartels. The process of backwashing a membrane remains the same no matter which way the flow of fluid is directed. Page 8 lines 6-8 argue that the backwashing method of Bartels is in the opposite direction as the filtration method of Selbie. One of ordinary skill in the art would however rely on the Bartels reference to teach the method of backwashing by applying a pressure below the bubble point to the membrane on the permeate side after filtration had occurred. As "backwashing" is a method of reversing the normal direction of flow through a membrane to dislodge anything which may have become entrapped during filtration, it is understood that the backwashing process is conducted in the opposite direction and subsequent to the filtering of a liquid suspension.

Regarding the arguments found on page 8 with respect to the declaration by Warren Thomas Johnson submitted on 21 May 2008, the argument is still not found to be persuasive. The reasoning that the method would not have been obvious to one of ordinary skill in the art due to the idea that doing so would reduce the production time as the membrane integrity test could be accomplished in a much faster manner than a backwashing process. The process of backwashing occurs much more often and therefore testing the integrity at this time would take too long, thus hurting production. This reasoning however is assuming that the integrity test is conducted during the backwashing process and not vice versa. If the backwashing was conducted only when the integrity needed to be tested, it would therefore eliminate the issue of excessive downtime since the system would be down anyway during this period. Such a process could occur when filtering a relatively clean fluid which does not require membrane backwashing as often. The combination of the method teachings of Bartels with those of Selbie would therefore teach towards backwashing and integrity testing a membrane simultaneously as the backwashing method could easily be incorporated into the Selbie reference without undue experimentation. The Bartles reference is not relied upon for a teaching of the apparatus used for backwashing of a membrane, but rather for its teaching of backwashing in a similar manner to the integrity testing already being performed by Selbie. It is therefore found that one of ordinary skill in the art would have been able to combine the teachings to accomplish the claimed method accordingly.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Selbie US Patent 6,202,475 (hereinafter referred to as Selbie) in view of Bartels.

Regarding **claim 5**, Selbie discloses a method of determining flow rate through a membrane and testing the integrity of the membrane via a pressure decay method. A preferred method of performing the test consists of wetting a membrane, applying a gas to one side of the membrane below bubble point of the pores and measuring the gas flow across the membrane with a pressure decay measurement (column 1 lines 49-61). The method is further described in column 3 lines 8-16 as pressurizing the lumens to a test pressure while keeping the feed-side full ("allowing a gas pressure in the lumen of the membrane to increase to a predetermined level above a pressure on another side of the membrane"), sealing the filtrate side ("isolating the lumen of the membrane"), and monitoring the drop in pressure. Since the pressure decay is related directly to the membrane integrity, it would need to be compared "against a predetermined value" to decide if the membrane integrity is acceptable. Selbie does not disclose specifically a method of backwashing the membrane as claimed.

Bartels discloses a method for improving filtration performance of hollow fiber membranes comprising backwashing procedures. The process of backwashing membranes by reversing a flow through them was known in the art and practiced commonly. Figure 9 and paragraph [0048] describe a method of backwashing by introducing a gas pressure below the bubble point on the lumen side of the membrane. As the membrane is to be backwashed, the permeate within the lumens is pushed back through the membrane by the gas pressure. A similar process is described in the background of the invention of the present application. Since the method of Selbie also mentions applying gas pressure below bubble point to one side of a membrane (in this case the lumen side), it would have been obvious to one of ordinary skill in the art at the time of invention to use this step in a similar manner as disclosed by Bartels to backwash the system as well while measuring the integrity of the membrane within to keep the membrane free of fouling components, therefore lengthening its lifetime.

Regarding **claim 2**, by combining the teachings of Selbie with those of Bartels, the backwashing and integrity testing would be linked and thus the integrity test could be performed during every backwash if desired.

Regarding **claim 3**, by combining the teachings of Selbie with those of Bartels, the backwashing and integrity testing would be linked and thus the integrity test could be performed after any number of backwashes desired.

Regarding **claim 4**, Selbie discloses a method of calculating the logarithmic reduction values (LRV) for a filtration system. Selbie does not specifically disclose calculating a LRV of 4, however since the LRV corresponds to a value based on the

reduction of particles in the fluid, a value of 4 would reduce the concentration of an influent by 99.99%. Therefore, the LRV could be calculated based on the desired maximum allowed concentration of the effluent and could be 3 if a less filtered soulution was acceptable or 5 if a more filtered solution was needed.

Regarding **claim 6**, the backwashing methods disclosed in Bartels are all typically described as taking a minimum of between 1-5 seconds. Since the integrity test method of Selbie is essentially the same as the claimed invention, the addition of time due to backwashing would be within the claimed 30 seconds to one minute.

Regarding **claim 7**, the backwashing methods disclosed in Bartels are all typically described as taking a minimum of between 1-5 seconds. Since the integrity test method of Selbie is essentially the same as the claimed invention, the addition of time due to backwashing would be within the claimed five to ten seconds.

Regarding **claim 8**, backwashing and integrity testing in a system implies the filter is to be reused, thus the process of filtration would recommence once the backwashing and integrity test is complete. The method of raising a pressure on the exterior of a membrane to pass the liquid suspension through and into the lumen is known in the art and is described in paragraph [0005] of Bartels as well.

Regarding **claim 9**, Selbie discloses a method of determining flow rate through a membrane and testing the integrity of the membrane via a pressure decay method. A preferred method of performing the test consists of wetting a membrane, applying a gas to one side of the membrane below bubble point of the pores and measuring the gas

flow across the membrane with a pressure decay measurement (column 1 lines 49-61). The method if further described in column 3 lines 8-16 as pressurizing the lumens to a test pressure while keeping the feed-side full, sealing the filtrate side, and monitoring the drop in pressure (rate of gas pressure decay). Since the pressure decay is related directly to the membrane integrity, it would need to be compared "against a predetermined value" to decide if the membrane integrity is acceptable. Selbie does not disclose specifically a method of backwashing the membrane as claimed.

Bartels discloses a method for improving filtration performance of hollow fiber membranes comprising backwashing procedures. Figure 9 and paragraph [0048] describe a method of backwashing by introducing a gas pressure below the bubble point on the lumen side of the membrane. Since the method of Selbie also mentions applying gas pressure below bubble point to one side of a membrane (in this case the lumen side), it would have been obvious to one of ordinary skill in the art at the time of invention to use this step in a similar manner as disclosed by Bartels to backwash the system as well while measuring the integrity of the membrane within to keep the membrane free of fouling components, therefore lengthening its lifetime.

Regarding **claim 10**, the method of Selbie is described in column 3 lines 8-16 as pressurizing the lumens to a test pressure while keeping the feed-side full, thus reading on “allowing a gas pressure in the lumen of the membrane to increase to a predetermined level above a pressure on the external wall" as the external wall would be the outside of the lumen,

Regarding **claim 11**, the method as disclosed by Selbie in view of Bartels allows for the backwashing to occur as the pressure is introduced into the lumen, thus the increase to the predetermined level as claimed, occurs after the step of backwashing.

Claims 2-11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Selbie US Patent 6,202,475 (hereinafter referred to as Selbie) in view of the applicant admitted prior art.

Regarding **claim 5**, Selbie discloses a method of determining flow rate through a membrane and testing the integrity of the membrane via a pressure decay method. A preferred method of performing the test consists of wetting a membrane, applying a gas to one side of the membrane below bubble point of the pores and measuring the gas flow across the membrane with a pressure decay measurement (column 1 lines 49-61). The method is further described in column 3 lines 8-16 as pressurizing the lumens to a test pressure while keeping the feed-side full ("allowing a gas pressure in the lumen of the membrane to increase to a predetermined level above a pressure on another side of the membrane"), sealing the filtrate side ("isolating the lumen of the membrane"), and monitoring the drop in pressure. Since the pressure decay is related directly to the membrane integrity, it would need to be compared "against a predetermined value" to decide if the membrane integrity is acceptable. The background of the present application discloses a known method of backwashing a membrane by using a

pressurized gas or liquid to force impurities out of the membrane pores. It would have been obvious to one of ordinary skill in the art at the time of invention to perform such a backwash while determining the integrity as in Selbie since the gas pressure on one side of the membrane is already being increased. By introducing the gas on the lumen side of the membrane, the backwashing and integrity could be tested at once. Selbie further teaches the use of a gas blow the bubble point of the pores as is claimed. The combination would enable the membrane to be used longer and allow filtering to occur faster as previously clogged pores would be reopened.

Regarding **claim 2**, by combining the teachings of Selbie with those of the prior art, the backwashing and integrity testing would be linked and thus the integrity test could be performed during every backwash if desired.

Regarding **claim 3**, by combining the teachings of Selbie with those of the prior art, the backwashing and integrity testing would be linked and thus the integrity test could be performed after any number of backwashes desired.

Regarding **claim 4**, Selbie discloses a method of calculating the logarithmic reduction values (LRV) for a filtration system. Selbie does not specifically disclose calculating a LRV of 4, however since the LRV corresponds to a value based on the reduction of particles in the fluid, a value of 4 would reduce the concentration of an influent by 99.99%. Therefore, the LRV could be calculated based on the desired

maximum allowed concentration of the effluent and could be 3 if a less filtered soulution was acceptable or 5 if a more filtered solution was needed.

Regarding **claim 6**, the steps for integrity testing of Selbie for a logarithmic reduction value of 4 are the same steps as those in the claimed invention, therefore the testing would be able to be conducted over a 30 second to one minute period.

Regarding **claim 7**, the steps for integrity testing of Selbie for a logarithmic reduction value of 4 are the same steps as those in the claimed invention, therefore the testing would be able to be conducted over a 30 second to one minute period.

Regarding **claim 8**, backwashing and integrity testing in a system implies the filter is to be reused, thus the process of filtration would recommence once the backwashing and integrity test is complete. The method of raising a pressure on the exterior of a membrane to pass the liquid suspension through and into the lumen was known in the art.

Regarding **claim 9**, Selbie discloses a method of determining flow rate through a membrane and testing the integrity of the membrane via a pressure decay method. A preferred method of performing the test consists of wetting a membrane, applying a gas to one side of the membrane below bubble point of the pores and measuring the gas flow across the membrane with a pressure decay measurement (column 1 lines 49-61). The method if further described in column 3 lines 8-16 as pressurizing the lumens to a test pressure while keeping the feed-side full, sealing the filtrate side, and monitoring the drop in pressure (rate of gas pressure decay). Since the pressure decay is related

directly to the membrane integrity, it would need to be compared "against a predetermined value" to decide if the membrane integrity is acceptable. Selbie does not disclose specifically a method of backwashing the membrane as claimed, however in the prior art a known method of backwashing utilizing similar methods as that of the integrity test is disclosed. By pressurizing one side of a membrane at a pressure below a bubble point, the liquid permeate would backwash the membrane as claimed, while using the method for testing integrity as disclosed by Selbie to keep the membrane free of fouling components, therefore lengthening its lifetime.

Regarding **claim 10**, the method of Selbie is described in column 3 lines 8-16 as pressurizing the lumens to a test pressure while keeping the feed-side full, thus reading on “allowing a gas pressure in the lumen of the membrane to increase to a predetermined level above a pressure on the external wall" as the external wall would be the outside of the lumen,

Regarding **claim 11**, the method as disclosed by Selbie allows for the backwashing to occur as the pressure is introduced into the lumen, thus the increase to the predetermined level as claimed, occurs after the step of backwashing.

Regarding **claim 13**, a gas pressure is applied on one side of the membrane in Seilbie as previously disclosed, therefore "increasing" the pressure as claimed. It would have been obvious to one of ordinary skill in the art at the time of invention to increase it to a "predetermined level" as claimed in order to ensure consistent results during testing.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Selbie in view of the applicant admitted prior art.

Regarding **claim 12**, Selbie discloses a method of measuring a flow rate through a filtering membrane which would involve immersing it in a liquid suspension as is known in the art of filtation. The background of the current application discloses a backwashing method involving applying a gas at a pressure to one side of the membrane to backwash the liquid permeate though the filter membrane. Since the disclosure of Selbie discusses measuring the integrity of a filter membrane by applying a gas at a pressure blow the bubble point of the membrane, it would have been obvious to one of ordinary skill in the art at the time of invention to use a similar pressure for the backwashing process, since the pressure of Selbie is enough to force a gas flow back through the membrane, effectively backwashing it.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARK SHABMAN whose telephone number is (571)270-3263. The examiner can normally be reached on M-F 7:30am - 5:00pm, EST (Alternating Fridays Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. S./
Examiner, Art Unit 2856
/Hezron Williams/
Supervisory Patent Examiner, Art Unit 2856